

## **AMENDMENT TO THE CLAIMS:**

### **Listing of claims**

This listing of claims will replace all prior versions and listings of claims in the application

1. (Currently Amended) A method comprising providing an automatic hierarchical management of a computing infrastructure for at least one domain for an entity, said step of providing hierarchical management comprising:

obtaining a hierarchical representation of said at least one domain, said representation including:

a list of computing environments to be managed, at least one policy controlling acquisition of at least one resource from resource libraries for said at least one domain, and any sub-domains within said at least one domain, the at least one policy for controlling the number of reserve resources available to process requests from the at least one domain and the sub-domains; and

instantiating the representation.

2. (Original) A method as recited in claim 1, further comprising:

deriving a set of resources required for said list of computing environments in constructing said hierarchical management, and

providing resources for said set of resources to said at least one domain.

3. (Previously Presented) A method as recited in claim 1, further comprising at least one limitation taken from a group of limitations consisting of:

further comprising updating said at least one policy of the representation;

further comprising utilizing library services;

further comprising associating each computing environment with a particular sub-domain;

wherein the step of utilizing includes reserving a set of resources required by said list of computing environments;

further comprising acquiring the set of resources and using at least one resource from said set of resources;

wherein said at least one domain is a plurality of domains;

wherein at least one domain from said at least one domain is a sub domain of another domain;

further comprising associating at least one library service from said library services with at least one collector;

wherein both the quantity and types of base resources change over time, wherein said method is employed in providing service on-demand;

wherein said at least one resource is a base or composite resource;

further comprising organizing said at least one resource into a service offered to a plurality of customers;

further comprising allocating base resources to a library service;

further comprising formulating composite resources from base resources satisfying a service description;

further comprising allocating composite resources to a library service; and

further comprising allocating services to a library service.

4.-9. (canceled)

10. (Previously Presented) A method as recited in claim 3, wherein at least one of said at least one domain is a root domain.

11.-12. (Canceled)

13. (Currently Amended) An article of manufacture comprising a computer readable storage medium tangibly storing instructions, which when executed by a computer implement provisioning of hierarchical management of at least one domain for a computing utility, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 1.

14. (Original) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for providing hierarchical management of at least one domain for a computing utility, said method steps comprising the steps of claim 1.

15. (Currently Amended) An apparatus comprising means for providing hierarchical management of at least one domain for a computing utility, said means for providing hierarchical management comprising:

means for obtaining a hierarchical representation of said at least one domain, said representation including:

a list of computing environments to be managed, at least one policy controlling acquisition of at least one resource from composite resources for said at least one domain, and any sub-domains within said at least one domain, the at least one policy for controlling the number of reserve resources available to process requests from the at least one domain and the sub-domains; and

means for instantiating the representation.

16. (Previously Presented) A computer program product comprising a computer usable storage medium storing instructions, which when executed by a computer implement provisioning of hierarchical management of at least one domain for a computing utility, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the functions of claim 15.

17. (Currently Amended) A method comprising:

creating an automatic hierarchical representation of a computing infrastructure, for an entity comprising organizing the entity into a domain tree of domains, wherein each domain represents a different organization within the entity, said each domain obtains computing environments and resources from a computing utility, the computing utility comprising multiple root collectors, each root collector representing the organization within the entity, and enabling resource sharing of public resource pools between the different organizations based on an acquisition policy, the acquisition policy determining which resources are added or removed from the public resource pools for all of the different organizations.

18. (Original) A method as recited in claim 17, further comprising:

determining computing environments to be associated with each domain;

determining an acquisition policy and a distribution policy for each domain;

converting the domain tree into a collector hierarchy; and

connecting said collector hierarchy into a hosted root collector for a hosted environment.

19. (Original) A method as recited in claim 18, further comprising using said hosted environment to provision at least one computing environment and at least one resource to said entity.

20. (Original) A method as recited in claim 18, wherein the step of connecting is performed by a service provider.

21. (Original) A method as recited in claim 18, wherein the step of connecting includes connecting collector hierarchies for a plurality of customers of the hosted environment into the hosted root collector.

22. (Original) A method as recited in claim 18, wherein the step of converting includes inserting a collector as a hierarchy root collector of the collector hierarchy, determining a number of computing environments of the root domain of the domain tree and whether a sub domain of a root domain of the domain tree exist, if there is only one computing environment and no sub domains of a root domain of the domain tree, inserting a PMRS in the collector hierarchy and terminating the step of converting, otherwise, for each computing environment of said root domain of the domain tree, adding a collector and PMRS to the root collector of said collector hierarchy;

determining sub domains of said root domain of the domain tree that have only one computing environment:

for each sub domain of said root domain of the domain tree that has only one computing environment and no other sub domain, inserting a PMRS into the collector hierarchy, for each sub domain of said root domain of the domain tree that has more than one computing environment or other sub domains, placing said each sub domain on a domain processing list; and

repeating the step of inserting a collector, the step of determining a number of computing environments for each domain on the domain processing list as if it were a root domain, and the step of determining sub domains of said root domain of the domain tree that have only one computing environment, until said domain processing list is empty.

23. (Original) A method as recited in claim 18, wherein the step of connecting is performed by a service provider.

24. (Canceled)

25. (Previously Presented) An article of manufacture comprising a computer usable storage medium storing instructions, which when executed by a computer implement a method for creating a hierarchical representation of an entity, the method comprising the steps of claim 17.

26. (Currently Amended) A computer readable storage device readable the computer readable storage device tangibly storing instructions executable by the computer to perform method steps for creating a hierarchical representation of an entity, said method steps comprising the steps of claim 17.

27. (Currently Amended) An apparatus comprising:

means for creating an automatic hierarchical representation of a computing infrastructure for an entity comprising means for organizing the entity into a domain tree of domains, wherein each domain represents a different organization within the entity, said each domain obtains computing environments and resources from a computing utility, the computing utility comprising multiple root collectors, each root collector representing the organization within the entity, and enabling resource sharing of public resource pools between the different organizations based on an acquisition policy, the acquisition policy determining which resources are added or removed from the public resource pools for all of the different organizations.

28. (Previously Presented) A computer program product comprising a computer usable storage medium storing instructions, which when executed by a computer implement a method for the creation of a hierarchical representation of an entity, the method performing the functions of claim 27.

29. (Currently Amended) An apparatus comprising a plurality of collectors ~~to~~for ~~represent~~representing a plurality of domains in a computing utility the plurality of collectors comprising:

one or more root collectors and one or more non-root collectors, said one or more root collectors comprising a public resource pool, said one or more non-root collectors comprising a private resource pool, each of said plurality collectors being linked to at least one other collector, each of said plurality of collectors ~~collector~~ having:

a controller to control reserved resources for each domain;

a policy advisor to interpret acquisition policies; and

a resource manager to manage resource acquisition for computing environments, the resource manager managing resource acquisition based on the acquisition policies.

30. (Original) An apparatus as recited in claim 29, said apparatus further comprising at least one base resource library service, at least one collector is associated with at least one of said at least one base resource library service, said base resource library service having a Resource Operations interface and a Catalog interface.

31. (Original) An apparatus as recited in claim 30, wherein said at least one base resource library service includes at least one public Base Resource Library Service to provide library services to at least one domain, said public base resource library service having a Resource Operations interface and a Catalog interface.

32. (Previously Presented) An apparatus as recited in claim 29, wherein said Resource operations interface provides an operation taken from a group of operations consisting of: Reserve, CancelReservation, CheckIn, CheckOut, Query, Update; and any combination of these operations.



33. (Previously Presented) An apparatus as recited in claim 29, wherein said Catalog operations interface provides an operation taken from a group of operations consisting of: Reserve, Add, Remove, Update, Query, and any combination of these operations.

34. (Original) A method as recited in claim 10, further comprising a requesting computing environment making a request for a particular combination of resources checking said representation of the acquisition policy of said requesting computing environment to verify that satisfaction of the request for the particular of resources is within the acquisition policy of said requesting computing environment; and

repeating the step of checking for all parent collector of said requesting collector until any root collector is reached.

35. (Original) A method as recited in claim 34, further comprising determining if the acquisition policy is satisfied all the way to any root collector;

if the acquisition policy is satisfied the request is granted otherwise the request is denied.

36. (Original) A method as recited in claim 10, further comprising making a request for a particular combination of resources;

determining a starting collector to start a search for the combination of resources;

checking if the starting collector has at least one resource from said combination of resources, said at least one resource being a located resource;

checking if there is at least one library which includes at least one resource from said combination of resources, said at least one resource being a located resource;

repeating the step of checking at each collector from a starting collector to any root collector;

if all resources of said combination are located resources reserving all located resources, otherwise denying the request.

37. (Original) A method as recited in claim 36, further comprising calling arbitration to continue locating all resources from said combination of resources.

38.-43. (Canceled)

44. (Currently Amended) An architecture for a computing utility comprising an apparatus to provide at least one service for a plurality of clients, said apparatus comprising:

a Base Resource Distribution Service to allocate resources to said at least one service;

said Base Resource Distribution Service having at least one collector;

at least one Provisioned and Managed Resource Service coupled to said Base Resource Distribution Service to provision and manage said resources for said at least one service; and

at least one Base Resource Library Service coupled to said Base Resource Distribution Service to provide reservation and allocation of resources, said Base Resource Distribution Service providing a reservation of resources even when resources are not currently available.

45. (Original) An architecture as recited in claim 44, wherein said Base Resource Distribution Service comprises:

at least one collector, each collector anchoring a representation of a particular domain and holds polices of said particular domain and holds resources reserved for said particular domain;, and

an arbiter coupled to said base resource distribution service and available to each of said collectors, said arbiter provides dynamic resource allocation to each collector of said computing utility.

46. (Original) An architecture as recited in claim 44, wherein the architecture is used by an on-demand service.

47. (Previously Presented) A computer program product comprising a computer usable storage medium storing instructions, which when executed by a computer implement a method for controlling and managing resources, the method performing the functions of claim 29.